and even millions are annually thrown away in the several departments of the army and navy, and in various branches of the civil service, would it be too much to call upon the Government for an annual grant for the completion of this important work?

If the surveyors of the United Kingdom were to convene public meetings, and present memorials to the state by means of deputations, or through members of Parliament, embodying these sentiments, perhaps some inducements might be held out to the members of her Majesty's Government to cause them to listen to the prayer of the requisitionists, and bestow some little attention upon the matter; but as long as both they and the public are silent, the same dilatory policy will still be persisted in, and both the nation at large and the parties alluded to continue to be deprived of the advantages of the contemplated work.

E. E. M.

RAILWAY JOTTINGS.

Great exertions are being made to complete the Oxford, Worcester, and Wolverhampton line, and a large number of men are employed on the works. At Cassington, about four miles from Oxford, upwards of 200 are employed in excavating and constructing the line.——The Rugby station is being enlarged. Between 50 and 60 labourers are employed levelling a large piece of ground on the Rugby side of the Trent shed, for the purpose of building an engine shed and other offices. Mr. Dunkley is the contractor.——From the traffic returns of week before last we find an increase in the receipts of the following lines over those of the corresponding week of last year:—London and North-Western, 1,080*l.*; London and South-Western, 1,800*l.*; Lancashire and Yorkshire, 3,900*l.*; Bristol and Exeter, 800*l.*; Brighton, 2,660*l.*; Lancaster and Carlisle, 575*l.*; Manchester, Sheffield, and Lincolnshire, 1,810*l.*; Great Northern, 6,030*l.*; East Lancashire, 1,000*l.*——It has been announced that from 1st inst. parties were to be allowed to inspect the tubes of the Britannia Bridge under guidance of an officer of the Chester and Holyhead company, from 8 a.m. to 8 p.m., Sundays excepted.——A correspondent, "R. M.," suggests, with reference to the recent fatal accident at Frodsham tunnel, that a bell ought to be attached to every tender to announce the access of danger in various circumstances, whether in a tunnel, in a fog, or by night, to be used whenever the whistle is incapable of sounding the alarum.

STATISTICAL SOCIETY OF LONDON.

NATIONAL DEBT.

On the 19th of May, Mr. T. J. Brown, assistant secretary, read a paper on the national debts and revenues in proportion to the population and extent of area of the various states of Europe. The data of this paper were obtained from the "Almanack de Gotha," a work of Oberhausen, "Reden's Statistical Journal," "Ritter's Statistical Geography," another by Rieliter, and the "Conversations Lexicon," published at Leipsic by Brochausen. The total amount of debt borne by the fifty-eight European states was shown to be 1,753,978,127*l.* of which the eight republics sustain three-twentieths, and the monarchies the remaining seventeen-twentieths. Every geographical square mile in Europe is burdened with an average of 9,740*l.* of the public debt, Hamburgh sustaining the *maximum* of debt in proportion to its area, and Russia and Turkey the *minimum*. And in proportion to the population of Europe, an average of £6.15 per head was indicated; in this case the Netherlands sustaining the *maximum* and Russia the *minimum*.

The revenues of the European states yield a total of 207,301,752*l.*; of which 53,386,293*l.* is derived from the republics, and 153,915,459*l.* or three-fourths, from the monarchies; Spain holding the worst position as regards the amount of revenue opposed to the national debt, the interest upon which, at 5 per cent., would consume the whole revenue; whilst Prussia requires only a fourteenth of its revenue to be so applied. The paper was purely statistical, and proved that it is not the amount of debt that undermines the state credit, but the want of the natural resources to cover the required interests.

NORTH LONDON ARTIZAN SCHOOL FOR DRAWING AND MODELLING.

The distribution of prizes took place on Wednesday at the North London School for Drawing and Modelling. The school has now passed through a twelvemonth of its existence, and accommodated from time to time above six hundred students. The school is gradually paying its way. The masters, working *eos amore*, have much work and very little pay. The prizes consisted of valuable books on art, contributed by Mr. S. C. Hall, and were distributed by the Rev. Mr. Laing. Short and appropriate addresses were delivered by the chairman, and also by the head-master, Mr. Cave Thomas.

IN THE CLASS OF FIGURE—FEMALE SCHOOL.

The first prize was awarded to Miss Isabel Scott; the second to Miss S. Mottram; to be mentioned with praise, Miss Annie Essex.

MEN'S SCHOOL.

The first prize was awarded to Mr. Montague Scott; the second to Mr. W. Mathews; to be mentioned with praise, Mr. Alfred Inman.

IN THE CLASS OF ORNAMENT—FEMALE SCHOOL.

A prize was awarded for the best shaded drawing to Miss Helen Byfield; a prize for the best outline drawing to Miss Eliza Bouton; to be mentioned with praise, Miss Fanny Harrison, Miss Esther Cons, Miss J. N. Harwood.

MEN'S SCHOOL.

For the best shaded drawing the prize was awarded to Mr. G. Jessup; a second prize was awarded to Mr. E. Mullett; to be mentioned with praise, Mr. Gardner, Mr. Valentine Linnett. Sir Charles Eastlake has written upon this drawing, "If completed, might have been No. 1."

MODELLERS' CLASS.

In this class it was exceedingly difficult to decide, so closely has the prize been contested; it has, however, after a very careful investigation, been awarded to Mr. G. Robertson.

STONE-WARE PIPES FOR CONVEYANCE OF WATER.

It has been said that earthenware pipes would long have been used for the conveyance of water under pressure, had it not been for the difficulty which presented itself in making the joints good: it is certain that there have been substances used which have answered the purpose, but these have generally been found too expensive, and again difficult in application on a large scale. Having had occasion recently to give my attention to this matter, I have pleasure in laying before you the result.

I have found that a joint made of a good quick-setting Roman cement is not only the best, but the cheapest which can be used, and these joints will sustain any reasonable amount of pressure.

I have set several lengths of stone-ware pipes, with the cement properly worked in with care, in a similar manner to what a plumber would make a lead joint, and have tested these in a hydraulic press, and have subjected the same to a pressure of 1501bs. on the square inch. Now, more than this is not needed; for, what these pipes are more applicable for, is not so much a service pipe, as a main or mains from the reservoir, for it is here where the purer body is so much needed, as the water in some degree lodges in the main so much longer, and consequently when the body of the pipe is impure, as is the case with iron, the water cannot fail to be impregnated with it.

I have found a difficulty in the testing of some of these pipes when being fitted in the hydraulic press, with the tightening of the discs, causing the collar or socket to crack entirely off with the pressure from end to end, but I attribute this to the socket not being formed with the pipe itself, as I have not been subject to the same casualty with those manufactured with the socket attached under Spencer's patent, which certainly for this purpose is valuable.

As regards the expense of these pipes, when proved, they are not one-third the price of iron.

I trust, before long, to see water companies taking up this matter with spirit, and through this medium supplying that greatest of blessings, water, in a purer and more wholesome condition.

M. B. Newton.

ACOUSTICS.—ANTIGUA.

The following is an extract from a letter, dated Antigua:—

"They say 'Acoustics' are not well understood by architects, as no recognised principle has yet been discovered. But, whether it was by accident or design, the hearing in this cathedral is perfect, and clergymen tell me they speak as easily in it as in a room. There is not the slightest echo. It strikes me that the mode of building may have something to do with it. To guard against earthquakes, the uprights and principals—in short, the framework of the building—are left within the walls, and then the outside is stone, whilst the inside is board, which covers the framework. Perhaps this wooden lining may act as a sounding board throughout, and its distance from the wall may deaden the echo. Might not something of the same kind be tried in the Houses of Parliament, if it be true that the voice is lost in them?"

The cathedral is built of stone, and lined entirely inside with pitch pine-boards. Distance from the wall to the board, 1 foot. The following is the inside measure to the boarding:—

Length of cathedral, 157 feet (including chancel).
Breadth, 52 feet.
North transept, 27 feet deep, by 46 feet wide.
South transept, 27 feet by 46 feet.
Height to the top of the cornice, above the plate, 23 feet.
Inside of the roof or ceiling, which is circular from the floor to the top of the arch, 33 feet (or nearly).

NOISOME REEK OF THE THAMES.

The river is the source from which three-fourths of the water supply is deduced, and doled out to the inhabitants of this great city: it is the grand medium of mercantile traffic,—and it is also the great sewer, or *cloaca maxima*, for two millions of citizens, and for as many more of the population inhabiting the precincts of the paternal stream and its tributaries.

So vast a body of water as flows down the bed through a course of some 100 miles may be considered to be but little tainted with the sullage and drainage that are discharged by numerous sewers and creeks in its course: above Staines the colour of the water seems to indicate no very serious vitiation of the main current: however, let a trial be made, by taking a row in a wherry at eventide, about sunset, and the sense of smelling must be very obtuse indeed if powerful evidence be not registered on the olfactories of the abominable contaminatories which are mixed in our cup—the only diluent that is accessible to the mass of the people.

Our tea is infused in it; our viands cooked; our toddy mixed; our milk watered with it; our beer brewed of it; and every liquid aliment commingles with the filthy *exuviæ* of the foul and more foully increasing tide: we lave in it: the body linen of the multitude is steeped therein; and when wrung out the desiccated essences of poison envelop the breathing pores of the wearers. In fact, this corrupt element—which, in the dread epidemic, bore disease in its course—enters into every modification of our sustenance, and we are, despite ourselves, enveloped in its influence, so that the water of life is not the tributary of life, but of death.

Having been often overpowered by the *fœtid* smell of the stream when steaming between Hungerford and London-bridge, I eschewed that mode of transit to the city, and set it down to the account of the Sanitary Commissioners, to their labours for the expurgation of Belgravia, or to the Buckingham-stairs mud, or to the Fleet ditch, with the other excrementary canals which yield their rich tributes to the tide. Long have I discontinued those

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